



Is the Baltic Dry Index System Ready for an Upgrade?

A Study of Freight Market Indices

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Abstract

We examine the shipping industry's need and interest in changing the way that freight market indices are made. Our research is conducted due to recent changes in the shipping industry, with more competition entering the scenery. In addition to this, IMO2020 has sparked debate regarding how freight market indices are made, the methodology underlying these indices, and a call for transparency.

Through in-depth interviews with Mark Jackson, CEO of the Baltic Exchange, and three other prominent voices in the shipping industry and a market-wide survey, we have mapped and synthesized the general attitudes toward freight market indices in the shipping market. The survey received responses from a wide range of market participants, capturing the opinions of respondents with different motivations for using freight market indices. Findings from the survey show that 76% of the respondents either want to explore alternatives to the Baltic Exchange indices or change the current methodology. We found that respondents wanting to explore alternatives to the Baltic Exchange indices were more sceptical of the broker's assessments and see the indices as easier to manipulate. Our research provides relevant findings for both the creators and users of freight market indices as we present an overview of the market's appetite for change. We have also mapped the attitudes of different market participants towards different methodologies. This can be of relevance for index-creators in their work with development and marketing of both existing and new products.

1. Introduction

Why do we use benchmarks? They are, amongst other things, used as a reference point for two individuals or institutions on opposite sides of a trade. Imagine two entities that want to trade silver in the future, entering a forward contract. They are directly incentivised to want opposite prices in the commodity traded, the seller wanting a high price and vice versa. Without a reference, they would not be able to agree on the price at settlement in an effective way. In addition to this, benchmarks help reduce asymmetric information amongst market participants, especially in over-the-counter markets such as the Freight Forward Agreement (FFA) market. *“Reliable benchmarks also reduce search costs in bilateral over-the-counter markets, where, in the absence of a centralized exchange, benchmarks can improve matching efficiency and increase participation by less informed agents”* (Duffie & Stein, 2015, p. 194). These preconceptions are reliant on the indices being unbiased, but as shown by the aftermath of the LIBOR scandal, this is not always the case (Duffie & Stein, 2015).

Because the shipping industry is one of the primary trade markets in the world, the need for reliable indices is important. In 2017 over 10.7 billion tons of goods were moved by sea according to the United Nations Conference of Trade and Development (UNCTAD, 2018). Dry cargo shipments accounted for 7.6 billion tons, which makes it by far the largest contributor to the shipping market with over 70% of the total volume (UNCTAD, 2018). Of these 7.6 billion tons 42,3% were dry bulk commodities, making dry bulk a crucial component of the global shipping scene. Throughout the years, the Baltic Exchange has developed a widely accepted set of freight market indices that are used by several market participants in the shipping industry. The indices are used mainly for three purposes; 1) trading FFAs, hereunder speculative trading and hedging, 2) do index-linked physical deals and 3) as a way for market participants to keep themselves up to date in the freight market, making the importance of them being optimal, crucial (Aury, 2019).

Our study is conducted due to an ever-increasing competitive market in shipping, combined with more data being available than ever as well as a call for transparency by the market participants and the International Organization of Securities Commissions hereafter referred to as IOSCO, (Pendered, 2014). S&P Global Platts launching their freight market indices in October has created an alternative to the Baltic Exchange (Miller, 2019). Mapping of the market participants' attitudes towards freight market indices is, therefore, increasingly important. One of the most prominent reasons for not wanting dual indices, that S&P Global

Platts now offer, is based on one of the key characteristics of the shipping market: low liquidity. Therefore, the importance of this study is further emphasized in the current market situation, as there are ongoing discussions regarding the topics highlighted in this paper.

The Baltic Exchange indices are created by a panel of shipbrokers which report rates on a daily basis. There is a set of guidelines created by the Baltic Exchange as to what information is being used, but not at what weight and how to synthesize this information. As discussed by Veenstra and van Dalen (2008), expert-generated indices, such as the Baltic Dry Index (BDI), are prone to subjectivity and there is little consensus as to which variables are to be included in the creation of these indices. This results in a potentially confusing and opaque creation of indices, which could mislead market participants using the Baltic Indices. Furthermore, the degree of subjectivity that is allowed in index production by the Baltic Exchange has been criticized and studies show that the degree of subjectivity in index production is likely to rise in markets with low liquidity and some heterogeneity in fixtures (Adland, Cariou, & Wolff, 2019).

Although the aforementioned effects of subjectivity in index production seem rather negative, there are also positive effects of the subjectivity. There are empirical studies that suggest that judgemental forecasts outperform statistical forecasts, especially in the case of unforeseen events (Duru & Yoshida, 2009). Quantitative methods are not able to forecast the largest shocks in the shipping industry such as wars, canal disputes and oil shocks, but experts in the shipping industry may be able to see these coming and hence adjust the index accordingly (Ariel, 1989). Even though the Baltic methodology is not a forecast, it is still forward-looking and takes into account upcoming events. Although a data-driven index based on the fixtures in a market may give a good representation of the current market situation, the predictive powers of such index will be limited, especially if unforeseen events are introduced.

An ever-increasing focus on sustainability globally has driven the shipping industry to regulatory changes. The International Maritime Organization, IMO, has initiated a stricter regime on the sulphur contents of the fuel that ships consume (International Maritime Organization, 2019). More specifically, the ships have to either install a scrubber which reduces the Sulphur oxides emitted from ships and continue to burn high sulphur fuels, or change to low-sulphur fuels that are compliant with the new regulations (International Maritime Organization, 2019). The market is split in the view of which option to choose, and large spreads on the different fuels are expected to occur (Miller, 2019). Following the

IMO2020 agreement regarding scrubber and non-scrubber fitted vessels, there has been a division as to whether or not to make separate indices for the two specifications (IHS Markit, 2018). The Baltic Exchange decided to go for a non-scrubber fitted benchmark vessel, and the decision led to controversy among the users of the Baltic Indices (Miller, 2019). As a direct competitor, to the Baltic Capesize 5TC index, S&P Platts launched its dual index platform in early October 2019 (Norfolk, 2019). There are clear differences in the methodology of index production at the Baltic Exchange and Platts. In contrast to the Baltic Exchange, who make use of a panel of brokers, Platts choose to involve a larger number of market participants in their index production ranging from shipowners, charterers, brokers and other market participants that make use of such indices, according to Peter Norfolk, Editorial Director for global shipping and freight at Platts (Norfolk, 2019). There are also differences in the underlying methodology as well. More precisely, while the Baltic Exchange uses the broker assessments of time charters as a starting point, Platts starts with the \$/tonne voyage rates and convert these to time charter equivalents (Miller, 2019).

The Baltic Exchange, as well as the IOSCO, has “*emphasised the need for indices to be grounded in real fixtures and market transactions*” (Pendered, 2014, p. 18), suggesting that the current system is potentially ready to be revised. Purely expert-generated indices might, therefore, be a thing of the past. We are therefore introducing a new methodology to the discussion, transaction-based indices. In this paper, transaction-based indices refer to indices that are based solely on confirmed fixtures in the market. This reduces the subjectivity and thereby offer a transparent system with a clear understanding of what information that is being used in index production. As explained in Adland, Cariou and Wolff (2019) there are mainly two alternative methods to produce price indices from heterogeneous transactions. However, in this paper, we do not distinguish between different ways of producing transaction-based indices, but present transaction-based indices as an alternative to today's expert- and broker-generated indices.

The paper will be focusing on the dry bulk segment of the shipping industry. More specifically the focus will be on the sub-indices of the Baltic Exchange Dry Index. The methodology used for creating these indices are also being used in other segments, such as the tanker segment, but for research and ease-of-read purposes - this paper will be primarily focusing on the largest

indices and routes covered by the Baltic Exchange. More specifically: Capesize 5TC¹, Panamax 4TC², Supramax 10TC³, C3⁴ and C5⁵. Limiting the paper to the dry bulk segment will also allow the construction of a survey which is more compact, therefore making it easier to answer and thus producing more answers.

The objective of this paper is to investigate the market views regarding freight market indices through interviews with key players in the shipping industry, as well as a market-wide survey. The contributions of this paper are threefold. Firstly, we examine what market participants think of the current production of indices. Secondly, we explore their stance on the methodology being used in making the indices. Lastly, we assess whether or not they think that competition should be introduced to the market.

The remainder of this paper is organized as follows; Section 2 is a literature review on research done on the Baltic Exchange, index production in shipping markets, manipulation of benchmarks, shipbrokers' role in index production and lastly the LIBOR controversy. Section 3, here we explain the methodology that is used to collect and analyse data in this paper. Section 4 contains the empirical results collected through the survey. The results are analysed and discussed with respect to the purpose of this paper. Section 5 is the concluding remarks of this paper where we summarize the findings.

¹ Capesize 5TC is a weighted time-charter average figure for Capesize vessels based on five important dry bulk routes (Baltic Exchange Ltd. , 2019).

² Panamax 4TC is a weighted time-charter average figure for Panamax vessels based on four important dry bulk routes (BMTI, 2019).

³ Supramax 10TC is a weighted time-charter average figure for Supramax vessels based on 10 important dry bulk routes (SGX, 2017).

⁴ C3 is an index based on a Capesize time-charter route from Tubarao to Qingdao (Safety 4 Sea, 2014).

⁵ C5 is an index based on a Capesize time-charter route from Western Australia to Qingdao (Safety 4 Sea, 2014).

2. Literature Review

Research on freight rates is primarily focused on which factors that are significant in pricing the spot freight rates. The earliest literature focused on the supply and demand equilibrium models, while literature starting from the 1990s focused on stochastic representations of the freight rate, such as Ekern & Bjerksund (1995) and Kavussanos M. G. (1996). Different studies have also tried to establish a connection between these two approaches with the use of stochastic partial equilibrium models such as Adland and Strandenes (2007).

Adland, Cariou and Wolff (2019) compared expert-generated and transaction-based price indices in the market for offshore support vessels (OSV). They developed a methodology which made it possible to extract market price indices from fixture data and compared these with expert-generated indices reported by a leading shipbroker company. While the OSV-market is not entirely interchangeable with the dry bulk market, it is a good proxy for discussion, since the indices are both expert-generated. The study revealed substantial differences between the two different methods of creating indices. Adland, Cariou and Wolff (2019) discuss the most common hypotheses explaining this phenomenon. The first one is that the panellists creating the expert-generated indices have private or “off-market” information which is taken into consideration. The previously mentioned guidelines from the Baltic Exchange allow for speculation in rumours, which further supports this sentiment. The second hypothesis is that heterogeneity in the fleet-composition and market players involved, or the composition of experts pricing the benchmarks, may be the drivers of the differences observed between the indices (Adland, Cariou, & Wolff, 2019). Their analysis concludes that there are two different conditions which make the observable gap between the indices increase. Firstly, when the day rates are high and secondly when the number of transactions is relatively low. They suggest that when the market is experiencing extreme conditions, such as periods with few contracts, the subjectivity of the experts’ judgement as to which information to include and consider may play a greater role.

Adland, Cariou and Wolff (2017) claim that standardized indices are essential for informational efficiency and transparency in any financial or commodity market. This is currently not the case with most expert-generated indices such as the Baltic Indices. Adland, Cariou and Wolff (2017) also highlight the problem of expert-generated indices by discussing the subjectivity of the brokers and how they rely on accumulated knowledge both by a single broker or a company. Following these arguments, they concluded that the outputs represent a

“black box” where we can observe the output, but not the inputs. This was further emphasized in Veenstra and van Dalen (2008) where they stated that “*what remains unclear, however, to the outside observer, is how this information is transformed into economic indicators such as price indices.*” They continue this by pointing out that there is only a marginal consensus as to what information is to be used at what rate, and which decisions this information is the foundation for. Secrecy as to how the indices are calculated, is also being problematized in their paper. As a conclusion Adland, Cariou and Wolff (2017) highlight that their approach using data-driven indices is not meant to be better and substitute the current solution. This is because they need a sufficient amount of transactions over a period of time to generate a significant result, followingly they are mostly unable to estimate indices at a greater frequency than weekly (Adland, Cariou, & Wolff, 2017). They also highlight that their model is based on realized and public transactions and is therefore unable to mirror the full picture which the expert-generated indices do, making use of rumours and non-public transactions. Transaction-based indices are only able to assess the current market view and the fixtures that are already confirmed thus making them unable to be forward-looking in the same manner, as highlighted by Duru & Yoshida (2009). Quantitative methods may be unable to quickly correct to the markets’ behaviour if something unexpected happens, largely because they utilise historical data and similarities of events (Duru & Yoshida, 2009).

Strandenes (2000) discusses the role of shipbrokers in a market efficiency context. The brokers act as an intermediary for sellers and buyers of freight services by matching them with their respective counterpart. She highlights their contribution to market efficiency and underlines that brokers are more updated on market-information compared to principals, and as an extension of this their knowledge of the current prices are more up to date. Furthermore, she also argues that they contribute to the transparency in the freight market as well as remove some of the subjectivity. This is exemplified by comparing an agents’ self-assessment of their own operations through an internet platform, which would be both biased and outdated, with the broker’s independent opinion.

A comparable way of creating indices is the methodology behind the London Interbank Offered Rate, formally known as LIBOR. In short, this determines the rates used by large banks when borrowing to each other on an unsecured basis (Kiff, 2012). Similar to the way the Baltic Exchange sets their daily rates, LIBOR is determined once a day by polling judgement-based estimates of the current borrowing-rate. Duffie and Stein (2015) highlights several problems with LIBOR, and in extension general problems with judgment- or expert-

generated benchmarks. They start by discussing the incentives of the banks to bias the rates and continue by explaining what could be done to reduce the risk of manipulation. Firstly, banks would signal that they are more creditworthy than they are by lowering the interest rate – distorting the accurate depiction of how the banks were financially. This is referred to as «reputational» manipulation. Secondly, the banks could make their financial positions more profitable by biasing the LIBOR to fit the position they have taken. Rauterberg and Verstein (2013) refer to this type of manipulation as “positional”, and they highlight that people regard it as likely that the banks would have a position which may benefit from movements in the LIBOR. To combat these problems, Duffie and Stein (2015) propose the two following principles:

1. Transactions should be the foundation of benchmark creation. They also highlight that this is a suggestion from several policymakers, E.g. IOSCO
2. They strongly advocate greater use of alternative benchmarks reference rates

They continue this sentiment by highlighting the issues of making market participants move to other, more manipulation-robust, rates. Namely, the high liquidity offered through the LIBOR is unrivalled, therefore individual actors are not sufficiently incentivised to move to another system. However, the scandals prevailing as an aftermath of the financial crisis in 2008 has shaken the LIBOR to its core, and a discontinuing of the benchmark is predicted to take place in 2021 (The Economist, 2019).

Rauterberg and Verstein (2013) study the mechanics of financial indices, focusing on LIBOR. They study the scandal in detail, proposing three different ways of manipulation: “reputational”, “positional” and “rogue trader”. The first two were discussed in the previous chapter, highlighted by Duffie and Stein (2015). “Rogue trader” is introduced as an alternative way of manipulating, diverging from the view that manipulation is coming from “the top”. This theory focuses on individual traders’ incentives to manipulate to gain on their current positions. More interestingly they propose some market solutions to these challenges. The introduction of competition would be a self-regulating solution to some of the problems. When a market, in this instance index production, is introduced to competition the providers must maintain quality to retain users. They must also limit malpractice and manipulation. How strongly the market reacts to competition entirely relates to the current providers’ willingness to combat the loss of users, as well as the cost of moving to a new index incurred by the users (Rauterberg & Verstien, 2013). Switching costs may be substantial to users of the indices,

especially if the proposed alternative is not thoroughly tested or known. Users with large books may not be properly incentivized to change, even if the alternative incurs a lower risk of manipulation. Furthermore, Rauterberg and Verstien (2013) state that the network effects of the indices are highly important to the users and it is followingly natural to see one index-provider dominate niche markets. If an index becomes dominant, this will affect the liquidity of other indices, which may incentivise the market participants to use the dominant index even though it is subject to manipulation or misproduction (Rauterberg & Verstien, 2013).

Because of the Baltic Exchanges' dominant position in the market, one might argue that competitors might have a hard time establishing in a generally conservative shipping market. Along with this they also problematised underproduction of indices. They accentuate that given the nature of public goods, indices will not exist in adequate numbers for market competition to have sufficient effects. Therefore, the introduction of additional indices might not resolve all the index related problems, but they note that they are more efficiently introduced where the providers are able to gain larger revenues (Rauterberg & Verstien, 2013). Both the pros and cons of competition are therefore highlighted in a great extent by this paper. Nonetheless, the topics excerpted from the paper are all relevant to our research question and in extension to expert-generated indices in general. The methodology of the LIBOR is especially interchangeable with the Baltic Indices in regards of how often they are updated, once a day, and how a panel of experts is the foundation for the rates comprising the benchmark, as previously discussed. However, the Baltic Exchange has several instances which are put in place to assure the quality of the reported freight rates given by the panellist. They control the panellist once a year to make sure they are still fit to report on the given routes (Baltic Exchange Information Services Ltd., 2019), the daily reports are quality-assured by the Baltic Exchange (Simpson Spence Young, 2018). In addition to this, the Baltic Exchange parallelly produces its own estimates of what the index should be for reference purposes. They have started to do statistical analysis on the assessments to discover outliers, which can signal possible manipulations. If the panellists' reports are too far from the trend, they will be interrogated by the Baltic Exchange for validation of the supporting evidence (Jackson, 2019).

3. Methodology

3.1 Interviews

In the preliminary research for this paper, we conducted two interviews with individuals that have expertise on the Baltic Indices and competitors of the Baltic Indices. These interviews were conducted in order to increase our knowledge and to get a second opinion on the questions we want the participants of the survey to answer. After gathering the survey results, we conducted two additional interviews with market professionals to further increase our knowledge, get relevant information to our paper and discuss our findings.

The interviews were conducted remotely due to large distances between us and the interviewees. Because the intention of the interviews was to increase our knowledge on themes relevant to this paper, it was conducted as a semi-structured interview where we followed a predefined set of questions but also allowed follow-up questions and additional questions where this seemed relevant. The choice of interview method is in line with the recommendations for explanatory studies given by Saunders, Lewis, & Thornhill (2016), as well as Carr and Worth (2001). They both recommend using semi-structured interviews as a method of gathering data where the goal is to explore the perceptions of the respondents. This strategy gave the interviewees the opportunity to elaborate on subjects they believed were of high importance for the study.

The interviewees are key players in the shipping industry. They are all both opinionated and relevant parties to our research question: “Is the Baltic Dry Index system ready for an upgrade?”.

Pierre Aury, CEO of Competitive Ship Brokers Limited, was of key importance to the preliminary studies of this paper, especially in regard to contributing to market insight in a rather opaque shipping market. His network, career and long experience enable him to express well-informed opinions in a wide range of topics regarding shipping and freight market indices. Mr Aury highlighted, amongst other things, the current problematization regarding dual indices as an aftermath of the IMO2020 regulations, especially focusing on splitting of liquidity. He emphasized the urgency of facilitating the survival of the sparse liquidity in the shipping market by not splitting the indices as he views the scrubbers as nothing more than extra equipment to the ships. As this interview was used for preliminary research, he also

explained what the different Baltic dry indices were used for in the market – as well as the main critics and appraisal of these. Some of the critics brought up by Mr Aury was: It is not spot on where the market is, but as he explained – it cannot be, simply by the way the indices are constructed. The Baltic Indices does not follow the changes in the industry closely enough, but this was due to a process put in place to make sure that the indices are a predictable foundation for, amongst other things, FFA trading. He highlighted several benefits, including that one centralized provider of indices is good for liquidity, in a rather illiquid market. Furthermore, he reasons that if market participants were not content with the Baltic Exchange, it is a free market and the best provider would prevail.

Peter Norfolk, Editorial Director of “Global Shipping & Freight” at S&P Global Platts, contributed largely to the understanding behind the motivations and principles behind one of the most prominent competitors to the Baltic Exchange. One of the major reasons for launching the new dual indices was the discontent regarding the Baltic Exchanges’ decision of not publishing scrubber-fitted dollar per day numbers. Furthermore, Mr Norfolk reports positive feedback on their new index, and stress the importance of listening to the market in regard to what kind of products to offer. When asked if he believes that there will be enough liquidity for Platts and the Baltic indices to co-exist, he answers that only time can tell, but he also speculates in a possible rise in liquidity as a result of new attractive indices.

Mark Jackson, CEO of the Baltic Exchange, contributed largely to this paper with great knowledge to the shipping industry as a whole, as well as extensive, in-depth, knowledge about the Baltic Indices - which this paper focuses on. This has been the foundation of a significant portion of the discussion regarding the Baltic Exchange. Mr Jackson explained in great detail about the work that the Baltic Exchange does. More specifically, their methodology, different processes regarding how changes are made in the indices and in the company as a whole, the pros and cons of different methodologies, and how he views the future of the shipping market. He especially focused on the benefits and drawbacks of expert-generated indices as this was the most relevant for their business. Mr Jackson also explained how the Baltic Exchange develop internal reference indices as a way of discovering significant deviations in the broker-assessments.

Lastly, we interviewed one of the most prominent and promising creators of data-driven indices. While they chose to remain anonymous for competitive reasons, they were of great contribution to this paper by detailing their motivations, methods and principles when

creating data-driven indices. As per their request, we will not be disclosing any of the details from the interview in this paper.

The unique market-insight provided by these interviews created a diversified foundation for discussion as they were all from different market participants, with significantly different motivations and goals.

3.2 Survey

In order to investigate the scope of this study; the benefits and drawbacks with different ways of producing freight market indices, explore whether or not the users of the Baltic dry indices believe the system is ready for an upgrade and to examine if the market desires alternative solutions, we have conducted a market-wide survey. In pursuance of a market-wide application of the results of this study, it was important to capture the sentiment of all the different groups of users of the relevant freight market indices. As the shipping industry is truly international, there are not necessarily geographic proximity between the researchers and the respondents nor between the respondents themselves. Thus, in order to reach out to all the different groups of users, and to collect enough answers to do a meaningful analysis, we argue that the use of questionnaires was the most convenient method to collect primary data. Due to the nature of a cross-sectional study with self-completed online surveys, the results will only provide a “snap-shot” of the sentiment in the market in the period the survey is completed (Fink, 1995).

We made use of mainly three distribution strategies. The survey was posted on LinkedIn from the profile of a well-reputed shipping professor with a large network in the industry. By distributing the survey through the professional network of a professor who has a diversified connection to the shipping industry, the chance of biased survey results was reduced as opposed to the process of calling specific actors in the market, causing a selection bias. Selection bias occurs when the participants of a survey are not representative of the market, which would most likely be the case if we specifically targeted some institutions to answer (LaMorfe, 2016). Furthermore, the survey was sent to the two interviewees that were interviewed as a part of the preliminary research. Lastly, the Baltic Exchange distributed the survey to its members after we gathered a substantial, unbiased, number of responses. We waited until the “unbiased” market responded before collecting data from the Baltic Exchange members specifically. This allowed us to filter responses to check for biases, however, the

responses gathered from the members were in line with the already gathered responses allowing us to continue with the regular analysis. It should be noted that respondents being passionate about the subject might be incentivized to have gathered like-minded people to contribute to the survey-results and may therefore have slightly skewed the results.

Due to the chosen way of distributing the survey, we could not calculate an accurate response rate. Our closest estimate is that the post distributed by the professor gathered 6000 views of which 1% of these chose to complete the survey. This does not tell us how many relevant individuals that saw the post, therefore this is also an inadequate measure of response rate. We were unable to retrieve the number of individuals that received the survey through the Baltic Exchange network, therefore we cannot specify the response rate here either. However, we can say something about the number of respondents and the number of responses that are not completed. The survey consists of 63 completed surveys. In addition to this, 114 individuals started but did not complete the survey. Most of the respondent who did not complete the survey stopped when the questions got more technical and required rather high knowledge of how indices are generated. If not otherwise noted, the data presented in this study are extracted from the 63 survey responses that we have collected.

When doing a survey, a critical question to ask is how large the sample, the number of respondents, should be. We found it hard to quantify the size of the population because the survey was aimed at everyone who in some way make use of the Baltic Exchange Dry indices. This limitation made it impossible to calculate a proper sample size. Therefore, we studied other papers written on subjects related to our study who made use of surveys in order to investigate how many respondents they achieved. These papers had between 30 and 85 responses (Cullinane, 1991; Kavussanos, Visvikis, & Goulielmou, 2007; Dinwoodie & Morris, 2003). When facing the IMO2020 regulations the Baltic Exchange, or more specifically the Baltic Index Council (BIC), prepared a consultation paper on the issues that follow the new regulations. When the BIC asked the Baltic Exchange members whether the fuel definition for the reference ship had to be changed, they received 37 responses where 27 voted “no” whereas 10 members voted “yes” (Miller, 2019).

Based on the work by Cullianne (1991), Kavussanos, Visvikis, & Goulielmou (2007) and Dinwoodie & Morris (2003), and the internal survey done by the BIC, we argue that our study with 63 respondents is sufficient to investigate the market views on the Baltic Indices and the attitudes towards new ways of generating indices in the dry bulk segment. In addition to this

Mark Jackson, CEO of the Baltic Exchange, revealed that their main source for assessments of the member's satisfaction with the index is through the Baltic Advisory councils (Jackson, 2019). These councils are made up of 12 members of which a maximum of four can be shipbrokers. The members in the Baltic Advisory Councils are specialists, and the method to collect data in this way is fundamentally different from a survey-based data collection process. However, our sample size is about 5 times larger, therefore, we argue that the survey has enough respondents to effectively map the market belief regarding the Baltic Indices and other alternative index production methods. Furthermore, the respondents are spread across several market players, and the distribution of respondents based on the type of institution they work for are described under "Categorical data" (see chapter 4.1).

The survey consisted of two types of questions, closed-ended questions and open-ended questions. The closed-ended questions can be divided into two sub-groups, ordered response and unordered response. The "ordered response" questions are questions where the respondent answer by using a rank- or Likert scale while the "unordered response" questions are multiple-choice questions with predefined answer options (Lazar, Feng, & Hochheiser, 2017). The open-ended questions are questions that "*allow respondents to give answers in their own way*" (Saunders, Lewis, & Thornhill, 2016, p. 452). Saunders, Lewis & Thornhill (2016) also state that open-ended questions are suitable in situations where the researchers want to reveal attitudes among the respondents. However, the number of open-ended questions was held to a minimum. This was mainly for two reasons; 1) participants tend to skip more questions or give insufficient answers to open-ended questions (Reja, Manfreda, & Vehovar, 2003) and 2) responses to open-ended questions are very time consuming to code when there is a great number of respondents (Saunders, Lewis, & Thornhill, 2016).

3.2.1 Categorical data collection (unordered response)

We used unordered response questions as a tool for categorizing the respondents. By choosing between predefined options, the respondents indicate:

- Their age
- What kind of institution they represent
- Whether or not they are a Baltic Exchange panellist
- If they are using any of the Baltic Indices in a professional way

The output from the above-mentioned questions can be labelled as categorical data (see Section 4.1).

We also gathered information about how the respondents are using the freight market indices on a daily basis. This is foremost to create a view of how the current indices are being utilised, but the statistics can also be used to gauge which needs the future solutions has to accommodate. In these questions the respondents were given the possibility to give multiple answers, hence this question received an increased number of responses - given that they were making use of the indices in several ways. The predefined categories they could choose from were: “Keeping yourself up to date”, “Using indices to do index-linked physical deals”, “Using indices to trade FFAs “, “Other”, which allowed respondents to uniquely define how they use the Baltic Indices. The question also contained an option for “I am not using any freight market indices” in case that they do not use any indices - but are still opinionated in this regard. However, none of the respondents who completed the survey chose this option.

To further investigate what the respondents are using the indices for, we made them define which of the indices they were using for their previously defined usage. Exemplified this means that a person who chose “Keeping yourself up to date” would have to choose which of the indices they used for this purpose. The intention of this is to examine if some indices are more expendable than others, as well as mapping which indices that may be robust in the event of substitute-indices. They were able to choose multiple answers in this section, leading to a higher number of responses than respondents.

3.2.2 Likert-style question collection (ordered response)

The ordered response questions in the survey were Likert-style rating questions. In these questions, the respondents are asked how strongly they agree or disagree with different statements. The possible responses were a 5-point rating scale presented in a straight line giving the respondent the possibility to “Strongly Disagree”, “Somewhat Disagree” “Neither Agree nor Disagree”, “Somewhat Agree” and “Strongly Agree.” The Likert scale questions are coded as 1 to 5 where “Strongly Disagree” represents 1, and “Strongly Agree” is given the number 5. This made the analysis easy to manage and it provided consistency to the coding. The 5-point rating scale was chosen so that the respondents would be able to choose a neutral answer. This was done due to the technical nature of some of the statements and because we wanted to avoid forcing a “positive” nor “negative” answer from respondents who are neutral

or do not have enough knowledge of that exact statement. A list of the Likert-style questions can be found in appendix 4.

When analysing survey data collected through Likert-scales, it was important to evaluate the internal consistency of the results. To do this, we made use of the Cronbach's alpha, which "... *measure the internal consistency reliability among a group of items combined to form a single scale*" (Litwin, 1995, p. 24). The measure is a reflection of how well the different questions measure the same aspects of the same variables (Litwin, 1995). In other words, the Cronbach's alpha measures the homogeneity of the scale. George and Mallery (2003) provided a general rule for the interpretation of different Cronbach's Alpha values: values above 0.9 are seen as excellent, values between 0.9 and 0.8 is seen as good and lastly, values between 0.8 and 0.7 are acceptable. For the questions regarding the Baltic Indices, we achieved an alpha of 0.8754 which is seen as a good result. For the questions regarding the transaction-based indices, the alpha value came out lower than for the Baltic Indices, with 0,7492. However, this alpha value indicates acceptable internal consistency reliability. The Cronbach's alpha values were calculated in Stata and the values for the two sets of questions are found in appendix 3.

The arguably most important question in our survey was "Do you think that the Baltic Exchange should be the only provider of indices?". Therefore, we studied the correlation between the respondent's desire to keep the Baltic as the only provider of indices, specifically looking at the differences in the mean response regarding benefits and drawbacks of respectively, the Baltic Indices and transaction-based indices. Two methods of doing this was employed: 1) checking for differences in the means and medians, and 2) by testing the Spearman's correlations. The latter show if the correlations are significant at a 95% confidence interval or not, as well as direction. By direction we mean the sign of the coefficient, describing the relationship between the two variables. If the Spearman's Rho was positive it implies a positive correlation and vice versa. The data collected through the Likert-questions were not normally distributed, therefore we chose a non-parametric method of checking for correlation such as Spearman (D'souza, 2019).

Although the use of Likert-style questions is a good way to map attitudes, there are some critics of the method. One prominent critic of Likert-style questions is the difficulties that arise when collecting data through an ordinal scale such as the Likert scale. First of all, the distance between "Strongly Agree" and "Somewhat Agree" cannot be measured due to different respondents perceptions of the statement or the choice variables meaning that the variables

can be ranked, but we are not able to measure the distance between them (Sullivan & Artino Jr, 2013). Second of all, the predefined responses may not be able to capture the entire sentiment of the respondent. Regardless of these critics, we found that the Likert-scale was the best way to capture the views of different market participants as they were easier to answer and we therefore gathering more responses. In addition, we allowed for textual answers in sections that may require more explanation.

Can ordinal data, such as the Likert-scale data collected through our survey, that has been transformed into number-equivalents be interpreted as interval data, and can these numbers be used as a foundation for meaningful calculation of means? Sullivan and Artino Jr. (2013) provides insight into this controversy. They suggest that taking means of the scale-items is preferable if the concept they are trying to express is more abstract – such as trainee motivation or patient satisfaction. We suggest that our data fit these criteria and have consequently chosen to analyse and present our data using descriptive statistics by reporting both means and medians, as well as gauging of significant correlation with Spearman's Rho. We chose to also report the medians as this is the most commonly accepted way of describing data when dealing with non-normally distributed observations. This is also covered in Sullivan and Artino Jr. (2013), where they state that means may be an insufficient way of measuring the central tendency of the data if its non-normally distributed. They, therefore, advocate the use of medians for examining the central tendency of Likert scale data. We chose to report both the median and the mean as they are both useful to our data as now discussed. Both the median and the mean of each Likert-type question are shown in appendix 2, grouped by a differentiating factor: whether the respondents answered "Yes" or "No" to the question "Should the Baltic Exchange be the only provider of indices?". The reason for this grouping was that this is, in essence, what we are researching in this paper. "Yes" and "No" are dichotomous, with "No" being coded as 0 and "Yes" being coded as 1. To reiterate, a positive sign of Spearman's Rho exhibits a positive correlation and vice versa.

As (Pripp, 2018) suggests we start the analysis of questions with descriptive statistics, followingly we employ the Spearman's Rho coefficient to check for significance while remaining critical as to whether or not this correlation intuitively makes sense.

4. Results and analyses

To analyse our survey, we start by summarizing and presenting some descriptive statistics. The graphs and tabulations in section 4.1 will be used as a base in many of the following analyses. The Likert-style results will be analysed in section 4.2 and 4.3 where we examine the responses in relation to two main questions in the survey, respectively; “Do you think that the Baltic Exchange be the only provider of indices” and “Do you believe that shipbrokers should be the only entity contributing to the creation of indices”.

4.1 Categorical data

The largest differentiator between the respondents was which institutional category they were representing when answering the survey (Fig. 1). Shipowners and analysts represent the largest share of the respondents (Fig. 1). The distribution of respondents is rather good, and we are able to catch the attitudes of a wide sample in the industry. This industry-wide participation help make the answers in this survey less biased towards the opinion of a single category of institutions. In addition to the predefined categories, we have gotten some respondents in the “other” category. These include ocean freight specialists, financial advisors, a student and a shipping consultant.

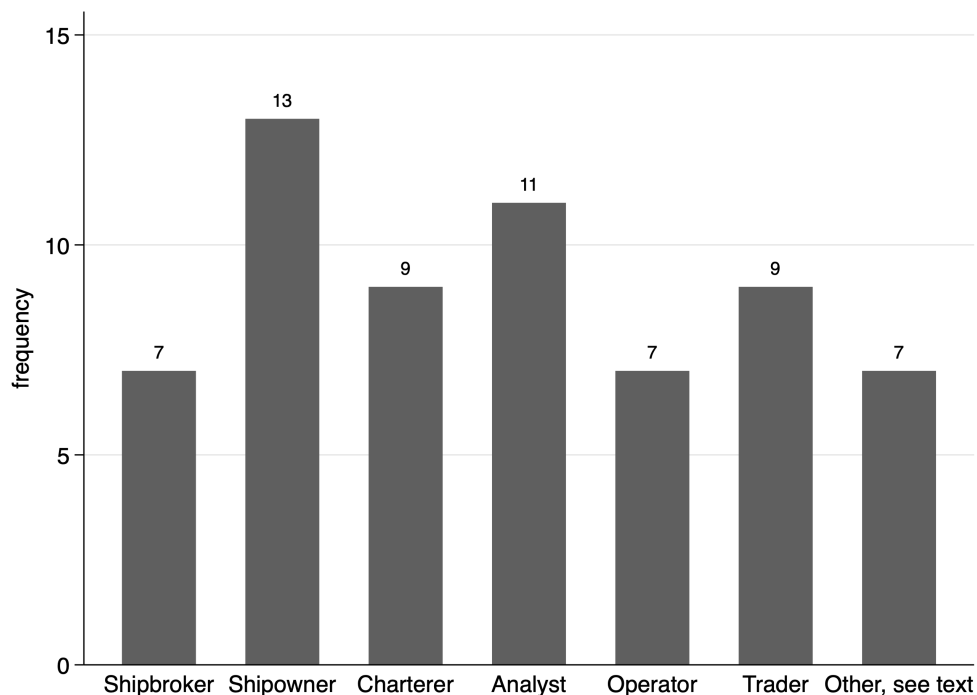


Figure 1, Distribution of Institutions

The most surprising results observable in figure one, are the number of shipbrokers that have participated in the survey. Before distributing the survey, this was the institution we believed would generate the highest number of responses. Our preconceptions in this regard were based on the fact that shipbrokers are the ones currently contributing to the creation of the Baltic Indices, therefore we thought that they would be opinionated in this regard. However, the distribution of respondents is, as mentioned, rather good, and we are able to catch the attitudes of a wide sample in the industry, consequently making the answers in this survey less biased towards the opinion of a single category of institutions.

Institution	Usage				Total
	Up to date	Index-linked	Trading FFAs	Other	
Shipbroker N = 7	6	3	1	0	10
Shipowner N = 13	9	5	4	1	19
Charterer N = 9	7	5	4	0	16
Analyst N = 11	9	1	2	3	15
Operator N = 7	5	5	6	1	17
Trader N = 9	4	4	9	0	17
Other, see text N = 7	7	0	0	0	7
Total	47	23	26	5	101

Table 1, Overview of how institutions use the Baltic Indices

Most of the participants of the survey concluded that they used the indices to keep themselves up to date with 47 out of 63 respondents reporting this usage (Table 1). However, since we opened for the possibility to choose multiple answers, many of these respondents also reported using the indices for other purposes such as doing index-linked physical deals and trading FFAs in parallel to keeping themselves up to date. The difference between the respondent's usage of freight market indices shows that we have captured a wide sample from the market. We reiterate the importance of mapping attitudes from many different market players and different ways of using the indices.

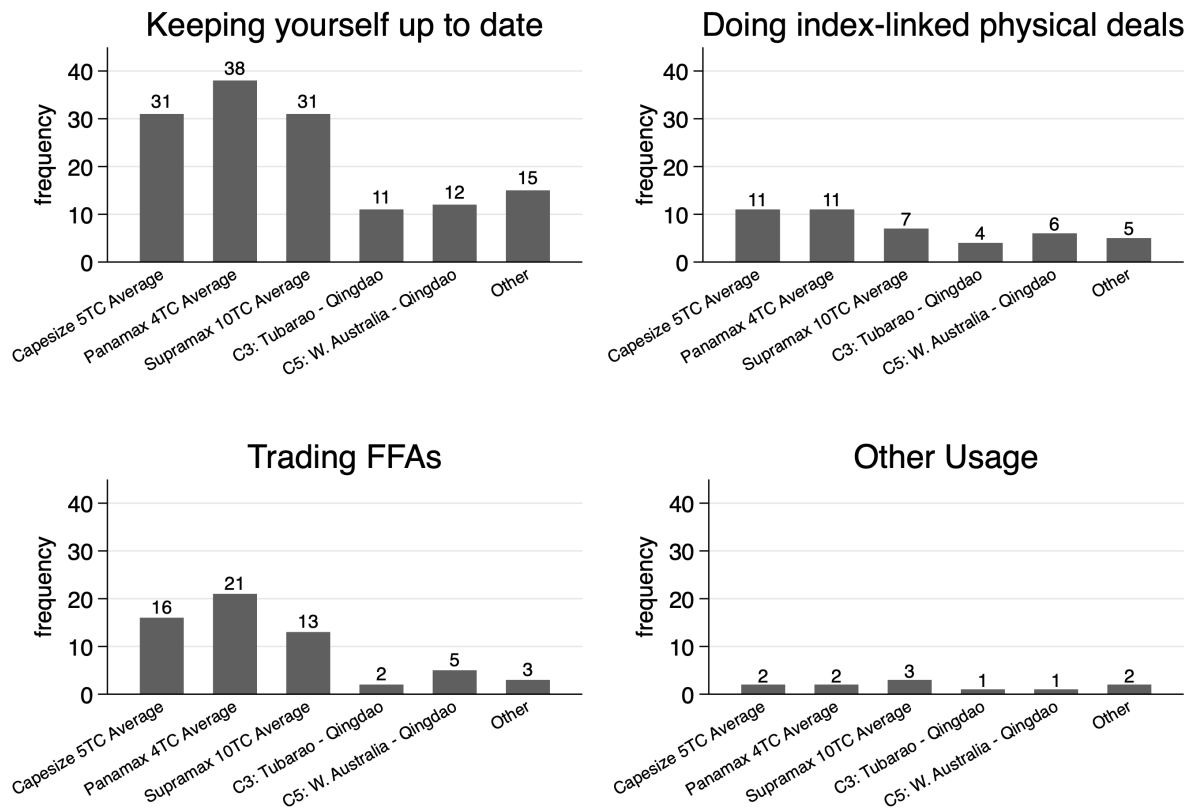


Figure 2, Aggregated results per predefined category as well as total uses of indices.

The “basket indices”, that make up an average of specific routes, are more popular than the indices based on the specific routes themselves (Fig 2). The Panamax 4TC index was relatively popular in all the categories of usage and scored particularly well among the respondents who trade FFAs. The most popular indices to trade FFAs on are the Panamax 4TC, Capesize 5TC and Supramax 10TC (Fig. 2). The index-linked physical deals, however, is more evenly spread over the different indices, both the aggregated indices and the route-specific indices.

4.2 The Baltic Exchange as the only provider of freight market indices

The foundation for discussion in this section is the respondents’ desire to keep, or change, the Baltic Exchange as the only provider of freight market indices. 46% of the respondents would prefer if the Baltic were not the only provider of indices (Fig. 3, left). Conversely, 54% are satisfied with the Baltic Exchange being the only provider. Breaking the results down by institution, the charterers, “other” and shipbrokers are rather positive to the Baltic Exchange being the only provider of indices, with positive answers making up between 62% and 71%

(Fig. 3, right). Notably, the survey shows that every panellist who completed the survey believe that the Baltic Exchange should *not* be the only provider of indices in the dry bulk market. It should be emphasised that there were only two panellists who completed the survey.

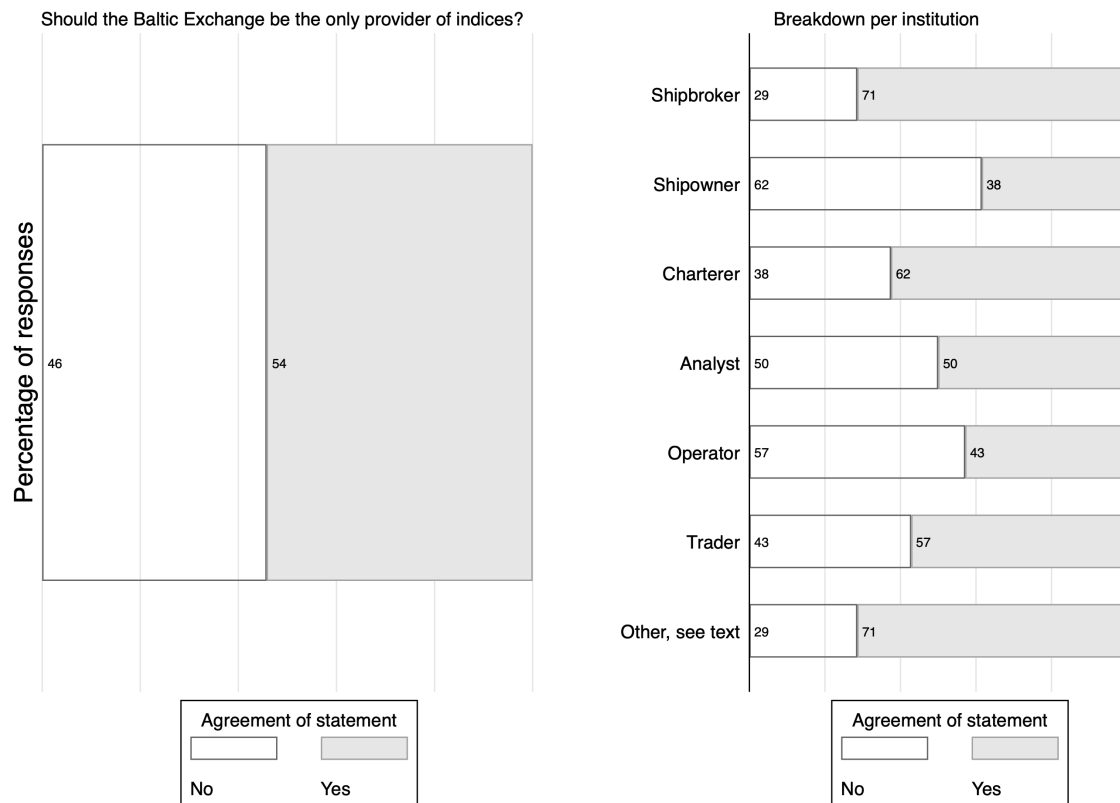


Figure 3, Baltic only (no or yes) and breakdown of responses per institution

The text entries gathered from the survey create a foundation for the continuation of deeper analysis and discussion of selected statements. In the text entries in the question asking whether the Baltic Exchange should be the only provider of freight market indices or not, there are two repeating arguments among the respondents who said “Yes”. The first argument is concerning the liquidity in the market -more specifically splitting of liquidity. They argue that a market with more than one provider of freight market indices on the same route, or basket of routes, will lead to fragmented liquidity, resulting in a less effective FFA market. The second argument is that the Baltic Exchange is a neutral, independent and credible provider of indices.

The Baltic Exchange has a long track record in the industry with a proven methodology that the market has accepted over a long period of time. In extension, if the Baltic Indices are neutral and unbiased, then the brokers who deliver their assessments to the exchange must be the same. A popular argument for shipbrokers ability to give neutral assessments of the market is that they do not have any vested interest in the development of freight rates. However, this is a simplified truth as it is not specifically stated in the “Guide to Market Benchmarks” that panellists, or other employees in the panel company, cannot trade freight market derivatives. The only reference to such activity in the guide is: “*The Baltic will generally not appoint as a panellist a firm which engages in principal trading (as opposed to broking) in the freight derivatives market*” (Baltic Exchange Information Services Ltd., 2019). Furthermore, shipbrokers are compensated by charging a commission for their services, usually a percentage of the agreed freight price (Strandenes, 2000). Strandenes (2000) refers to studies showing that a broker will, to increase his commission, increase the price of the underlying deal as much as possible. This implies that the shipbrokers have an interest in where the freight market indices are going. However, the shipbrokers ability to increase freight rates will effectively be limited by self-regulating mechanisms. As one of the respondents of the survey stated: “*The broker simply cannot afford to disappoint 50% of its clients at a time*”.

Out of the respondents who think that the Baltic Exchange should be the only provider of freight market indices, almost 50% said that shipbrokers should *not* be the only entity to contribute to the production of the indices. Intuitively this tells us that these respondents believe that the Baltic Exchange is, at least as of this moment, the most suitable provider of freight market indices while questioning their choice of contributing entities. In other words, these respondents are content with the Baltic Exchange being the primary freight market indices creator but would prefer that they changed the way that these are created - specifically regarding whom they collect their information from.

We will now present the Likert-type responses of benefits and drawbacks for the Baltic Indices and transaction-based indices. These questions can be found summarized in Appendix 4. In appendix 2, you see the tabulated means and medians of each statement regarding the Baltic Indices and transaction-based indices, given the respondent’s belief in whether or not the Baltic Exchange should be the only provider of indices. In other words, the means represent how much a respondent, on average, agrees with the statement, given their prejudice on the subject: “Should the Baltic Exchange be the only provider of indices”, hereafter referred to as “Baltic Only”. These means and medians are calculated from all of the responses collected

through the Likert scale ranging from 1 - 5 with 3 being a neutral standpoint. Under each statement, there are two variables: “Yes” and “No” signalling whether or not they want the Baltic Exchange as the only provider of freight market indices. For example, the first statement, Baltic Benefits 1, received a mean of 3.59 from respondents wanting the Baltic Exchange to be the only provider, while only 2.56 from the respondents opposing this. As we will address moving forward, some of the key statements from our survey gathered split responses from the opposing market views regarding the Baltic Exchange being the only provider.

On average we see that respondents voting “Yes” are more agreeing with the stated benefits, and more disagreeing with the stated drawbacks of the Baltic Indices – and vice versa. This is expected, but still important to note as this would have to be true for the discussion below to be of significance. If this didn’t hold, the inference made by comparing the difference in means would be useless. The differences are less apparent and drastic in regards to the benefits and drawbacks of transaction-based indices. We theorize that this is because it is less known, therefore respondents are less opinionated on this subject. The median values are as previously discussed also an appropriate metric to report and investigate for differences between groups.

Following is the discussion of findings from our survey. The statements that were selected for deeper analysis were either chosen because they exhibited a big difference in means or medians, a significant correlation with “Baltic Only” or a combination of all of these aforementioned metrics. Mentioning other statements in this section would contribute little to none as there was either little difference between the groups or insignificant in the correlation matrix. If a statement is significant at a 95% confidence level, it is signalling a possible correlation between the respondents’ level of agreement regarding the statement in question and “Baltic only”.

Abbreviations used in the following sections are; BB = Baltic Benefit. BD = Baltic drawback. T-BB = Transaction-based benefit and T-BD = Transaction-based drawback. The numbers simply represent their order of appearance in the survey-question. BB1 is, therefore, Baltic benefit statement one. For a complete list of questions, see appendix 4. The questions were as earlier described Likert-style questions ranging from “Strongly Disagree” (1) to “Strongly Agree” (5).

BB1 – “The panellist system of brokers gives a neutral assessment of the market”

Means – Yes: 3.59 No: 2.56

Median – Yes: 4 No: 2

Spearman’s Rho: 0.36 Significant at 95% confidence level: Yes

The findings presented above implicitly suggests a correlation between seeing the market assessment as more biased and wanting a different provider of indices. Being neutral is something that the Baltic Exchange actively focuses on, consequently making the assessments they provide through their compilation of indices of the same priority (Pendered, 2014). However, these findings do not necessarily conclude that the average respondent who wishes for a new provider of indices view the Baltic Exchange as biased, especially considering the mean score (2.56) being close to the “neutral” value being 3. Strictly speaking, it’s rather them being less agreeing of the respective statement, therefore *more* biased is the most fitting. We can also see a rather large difference in the medians between those who want Baltic to be the only provider and those who don’t, further cementing the abovementioned discussion. As discussed earlier, brokers may be incentivised to influence the indices to fit their bets in the market, as well as gathering higher commissions from larger deals. However, this may be the case with principles as well – especially for shipowners who directly benefit from higher rates. Strandenes (2000) mentioned, as previously discussed in the literature review, that the brokers are the entities who are most often in the market, making their opinions the most up to date.

BB2 – “The Baltic Exchange is an institution with a long track record and established trust in the market”

Means – Yes: 4.37 No: 3.59

Median – Yes: 5 No: 4

Spearman’s Rho: 0.42 Significant at 95% confidence level: Yes

We see the track record of the Baltic Exchange as irrefutable, dating back to 1744. Therefore, we suggest that the differences come from the level of trust established between the respondents and the Baltic Exchange. Both groups are on the positive end of the scale, both being over neutral. However, respondents who answered “No” has a lower trust compared to those answering “Yes” in the “Baltic Only” question – making this a possible contributing factor to wanting a change in providers of benchmark assessments. The difference in medians are lesser here, with “Yes” being 5 and “No” being 4. This suggests a heavily skewed distribution, making the mean a relatively unimportant statistic. We find a clustering of

respondents answering yes at 5 (Strongly Agree). It should also be noted that this is the highest median in the survey. Trust between market participants and financial instruments is fundamental, making this high median a possible strong contributor to wanting to keep the Baltic Exchange as the only provider of indices.

BB6 – “The Baltic index system using panels of brokers (not principals) means the daily spot indices are very hard to manipulate”

Means – Yes: 3.56

No: 2.56

Median – Yes: 4

No: 2

Spearman’s Rho: 0.31

Significant at 95% confidence level: Yes

The spread in means is rather large in this statement. One of the explanations behind this could be that one of the largest group of “institution” wanting to keep the Baltic Exchange as the only provider, is brokers. The respondents wanting to change the current market situation are slightly disagreeing with the statement. This suggests that they either view the panel of brokers as biased or that they see ways that it could still be manipulated even if it isn’t currently being done. Also, the differences in medians are substantial in this question, and the medians are located on different sides of the neutral value – making this a controversial statement. More than 56% of the respondents want to change the broker-only generated indices. This is reflected in the level of agreement reported in this statement. We investigate this further under the section titled “4.3 Brokers as the only contributor to the creation of freight market indices”.

BD3 – “The daily index is stale and reflects yesterday’s market situation”

Means – Yes: 2.74

No: 3.65

Median – Yes: 2.5

No: 4

Spearman’s Rho: -0.37

Significant at 95% confidence level: Yes

The difference in means under this statement is rather large, almost one score on the Likert-scale. In addition to this, they are both on each side of the neutral choice, making this a possibly controversial subject. Respondents wanting additional providers of indices, agrees with the index being stale – while the opposing view is tending to neutral, but still slightly disagreeing with the statement. Other providers might be able to effectuate more frequent updates of indices, lending hope to the respondents wanting change. There is a great difference in medians with “Yes” being 2.5 and “No” being 4, further cementing the abovementioned discussion. As more data is available to the market, the possibilities are greater for more

efficient solutions to index-creation. Financial instruments that are viewed as lagging because of stale benchmarks, is a potential reason for respondents wanting different solutions and creators of indices.

BD6 – “They are influenced by subjectivity”

Means – Yes: 3.56 No: 3.94

Median – Yes: 4 No: 4

Spearman’s Rho: -0.25 Significant at 95% confidence level: Yes

The problem with subjectivity has been highlighted earlier in this paper. Both respondents wanting the Baltic Exchange as the only provider and their counterparts agree with the statement of subjectivity. Those wanting to have additional providers of indices see the Baltic Indices as more influenced by subjectivity. As discussed earlier, expert-generated indices are inherently prone to subjectivity – therefore the alternative must either be created differently, e.g. transaction-based indices, or have stricter guidelines as to what goes into the assessment for index-creation. There is no difference in medians with “Yes” being 4 and “No” being 4, possibly rendering the discussion above as of little importance. As discussed in the literature review, Veenstra & van Dalen (2008) problematized the subjectivity of broker-assessment and the opacity of indices following this. Duffie and Stein (2015) highlighted the problem with brokers subjectivity concerning the LIBOR-scandal, furthering the need for indices to be anchored to transactions. Even though this could be a possible downside of expert-generated indices, their predictive powers are greater compared to transaction-based indices, as previously discussed.

BD7 – “The broker assessments underlying the indices are formed in a "black box" with no transparency as to what information is used”

Means – Yes: 3.30 No: 4.03

Median – Yes: 4 No: 4

Spearman’s Rho: -0.32 Significant at 95% confidence level: Yes

This relates to the concluding remarks of BD6 above. Implicitly, alternative indices are envisioned to have a more transparent methodology. Transparency of indices has been thoroughly discussed in the literature review and the market, through IOSCO, pushing for transparency. The median value of both respondent-groups is at 4, implying that they view the market as too opaque. Respondents wanting more providers are generally more agreeing as

seen by the difference in means. This is not a surprising finding, but rather a strengthening of previously discussed market views.

BD8 – “A daily index is insufficient in a fast-moving freight market. We should have real-time indices during Asian/London working hours”

Means – Yes: 2.63

No: 3.28

Median – Yes: 2

No: 3.5

Spearman’s Rho: -0.23

Significant correlation at 95% confidence level: No

This highly relates to the discussion under BD3 regarding the frequency of updates of the indices. We reiterate that, with an ever-increasing number of data available, market participants are slowly beginning to push for real-time indices. For now, the agreement of statements remains close to the neutral point of the scale, but it would be interesting to see how the market-view changes in the following years, especially considering the technological advancements in the shipping sector. There is a difference in medians with “Yes” being 2 and “No” being 3.5, creating a more distinct difference in views compared to the mean above. This implies that respondents wanting to keep the Baltic Exchange as the only provider are satisfied with only having daily updates.

Concluding these findings we see that respondents believing that there should be competing creators of indices, on average, think that the broker’s are more subjective, that the information being used is formed in a “black box”, that the broker’s assessments are easier to manipulate, and that the indices are staler.

4.3 Brokers as the only contributor to the creation of freight market indices

The respondents were also asked whether shipbrokers should be the only entity contributing to the creation of indices. The overall response and the response categorized by which institution they represent is shown in figure 4.

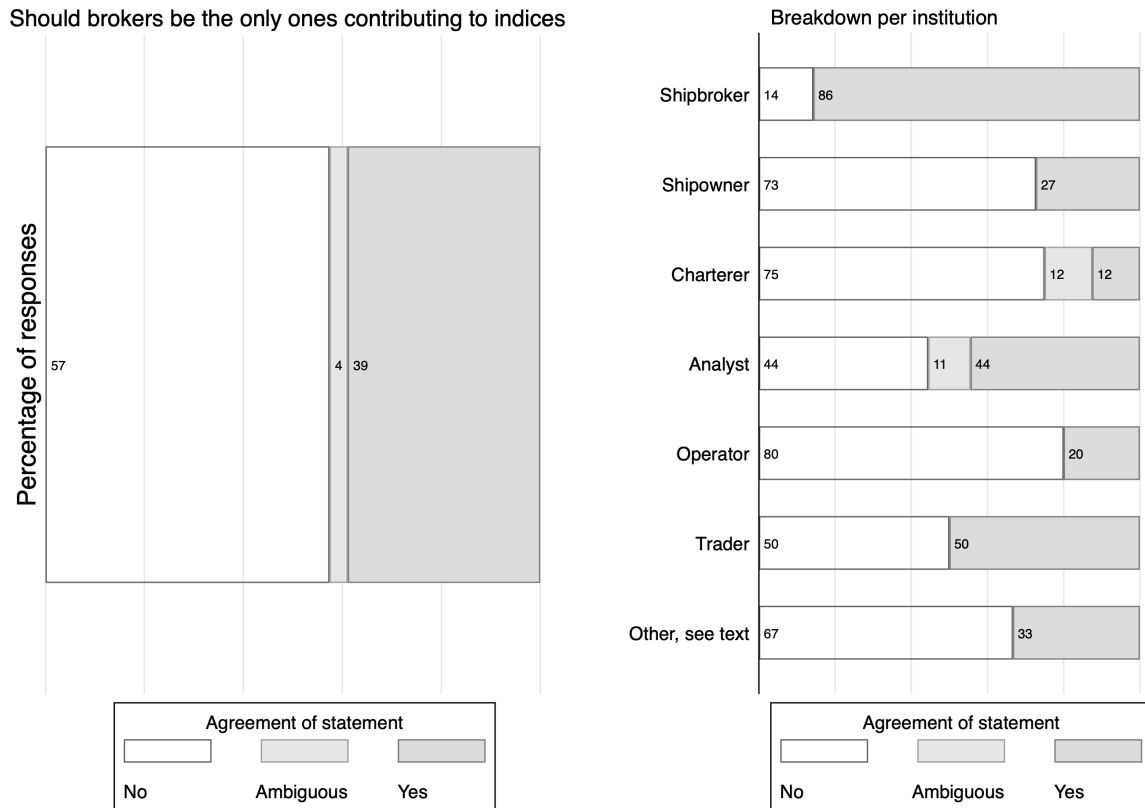


Figure 4, Brokers only (yes, ambiguous or no) and breakdown of responses per institution

57% of the respondents said that shipbrokers should *not* be the only entity that contributes to the index production. 4% of the respondents did not provide an explicitly positive nor negative answer to the questions and these responses are labelled as ambiguous. 86% of the shipbrokers who responded to this question believe that shipbrokers should be the only entity that contributes to the index production. Shipbrokers will not have an interest in where the market is going, they argue. Furthermore, we see that all of the other institutions, except analysts which are slightly below neutral, are either neutral or leaning towards a belief that shipbrokers should not be the only entity that contributes with assessments.

This question also allowed text entry where the respondents could express their opinions regarding shipbrokers being the only entity contributing with freight rate assessments to the Baltic Exchange. A number of respondents suggest that the data quality will increase if more market participants get to submit their data to the index-provider. Some explain this with an expectation of an increased number of transactions and other data-points submitted, while others simply say that other market participants should have a say as well.

We employ the same approach as we did in chapter 4.2, but with regards to whether or not they would like brokers to be the only contributors to the generation of indices. Firstly, we analyse the questions with descriptive statistics, followingly we employ the Spearman's Rho coefficients to check for significance while remaining critical as to whether or not this correlation intuitively makes sense. "Yes" and "No" are dichotomous, with "No" being coded as 0 and "Yes" being coded as 1. Therefore, a positive sign of Spearman's Rho exhibits a positive correlation and vice versa. To reiterate, if a statement is significant at a 95% confidence level, it is signalling a possible correlation between the respondents' level of agreement regarding the statement in question and "Baltic only".

Abbreviations used in the following sections are; BB = Baltic Benefit. BD = Baltic drawback. T-BB = Transaction-based benefit and T-BD = Transaction-based drawback. The numbers simply represent their order of appearance in the survey-question. BB1 is, therefore, Baltic benefit statement one. For a complete list of questions, see appendix 4.

BB1 – “The panellist system of brokers gives a neutral assessment of the market”

Means – Yes: 3.71	No: 2.58
Median – Yes: 4	No: 2
Spearman's Rho: 0.39	Significant at 95% confidence level: Yes

The findings presented above implicitly suggests a correlation between not wanting brokers as the only contributors to the generation of indices and seeing the market assessment as more biased. As discussed earlier, neutrality is a principle that the Baltic Exchange focuses on. However, we see substantial differences in the median and mean values, suggesting there is a divided view regarding brokers ability to deliver neutral assessments. These findings do not necessarily conclude that the average respondent who wishes for more contributors view the Baltic indices as biased, especially considering the mean score (2.58) being close to the "neutral" (3). Strictly speaking, it's rather them being less agreeing of the respective statement, therefore *more* biased is the most fitting. The divergence in responses may also be because of the respondent's skewness, with brokers being generally more in favour of broker-assessment.

BB6 – “The Baltic index system using panels of brokers (not principals) means the daily spot indices are very hard to manipulate”

Means – Yes: 3.95

No: 2.39

Median – Yes: 4

No: 2

Spearman’s Rho: 0.52

Significant at 95% confidence level: Yes

In this statement, the respondents who answered “no” to the “brokers only” question are less agreeing with the statement being a benefit of the Baltic Indices. This suggests that they either want additional contributors to reduce the possibility of manipulation from a single group of panellist, or at least that they disagree with broker-assessments being hard to manipulate. Furthermore, we can see that the correlation coefficient is among the highest reported in the survey. The spread in means is rather large in this statement with more than 1.5 scores in difference. One of the explanations behind this could be that one of the largest groups of “institution” wanting to keep brokers as the only contributors, is brokers, skewing the results.

BD5 – “Brokers’ Assessments reflects rumours, fixtures on subs that are not lifted etc. and therefore project a distorted market picture”

Means – Yes: 2.67

No: 3.81

Median – Yes: 2

No: 4

Spearman’s Rho: -0.44

Significant at 95% confidence level: Yes

The difference in means under this statement is rather large, more than one score on the Likert-scale. Respondents wanting additional providers of information to index-creation agrees more with the market picture being distorted – while the opposing view is tending to neutral, but still slightly disagreeing with the statement. They are on the opposite side of the neutral (3) which signals a slight controversy. As the sign of the Spearman’s correlation suggest, there is a negative correlation. In other words, an increase in agreement with the statement leads to a higher chance of wanting additional providers of information to indices-generation. Like the previous statements regarding brokers, this also has a great difference in medians – further confirming the broker-bias we have discussed. There is a great difference in medians with “Yes” being 2 and “No” being 4, further cementing the abovementioned discussion.

BD6 – “They are influenced by subjectivity”

Means – Yes: 2.90 No: 4.19
Median – Yes: 3 No: 4
Spearman’s Rho: -0.63 Significant at 95% confidence level: Yes

The problem with subjectivity has been highlighted numerous times earlier in this paper. Here we see, once again, a difference between the means of respondents. In other words, respondents wishing to keep brokers as the only contributors are less agreeing with the statement of the indices being influenced by subjectivity. As discussed earlier, expert-generated indices are inherently prone to subjectivity, furthermore, we argue that the problem with subjectivity might rise when there is only one type of contributors to the creation of indices. We find the highest correlation coefficient reported in this statement. The negative correlation indicates an inverse relationship between the respondent’s response to “brokers only” and the level of agreement in this statement. This gives that those who want shipbrokers to be the only contributors to the indices are less agreeing with the statement and vice versa. The medians are almost identical to the means, making both metrics an accurate representation of the central tendency.

BD7 – “The broker assessments underlying the indices are formed in a "black box" with no transparency as to what information is used”

Means – Yes: 2.81 No: 4.32
Median – Yes: 3 No: 4
Spearman’s Rho: -0.63 Significant at 95% confidence level: Yes

Respondents wanting to keep the brokers as the only contributor to the creation of indices are substantially more disagreeing with the statement above. This could be caused by the aforementioned problem of brokers being heavily represented in this category, causing biased results in this regard. They are arguably more likely to have obtained information of which elements that go into the indices through their work than other institutions. We also find the highest correlation coefficient reported in this statement. The central tendency of this statement is similarly represented by both the mean and the median, with “Yes” tending to neutral while “No” agrees with the statement.

T-BB1 – “They are based on confirmed fixtures, therefore they are not influenced by rumours”

Means – Yes: 3.24

No: 4.06

Median – Yes: 4

No: 4

Spearman’s Rho: -0.40

Significant at 95% confidence level: Yes

This is the only transaction-based statement we included in the analysis. The reason being that none of the other showed great divergence in responses, and as previously discussed we theorize that this is because of lesser knowledge on the subject – making the respondents less opinionated. However, this statement relates back to the previously discussed subjectivity issues, especially when considering rumours. Respondents wanting additional providers of information to index-creation also agree more with this benefit of transaction-based indices. There is no difference in medians, making the central tendency of this statement being around 4. Followingly, people view the lack of rumour-influencing of transaction-based indices as a benefit.

Concluding these findings, we see that respondents believing that there should be more contributors to the index-creation, on average, think that the brokers are more subjective, that they are easier to manipulate, and they view indices being influenced by rumours as more problematic.

4.4 Changing the Baltic Indices

Up until this point, we have mostly been investigating whether or not respondents want to move away from the Baltic Indices. In this section, we will discuss the possibility of keeping the Baltic Exchange as the creator of indices but changing their methodology of brokers being the only contributors. As previously mentioned, 46% of the respondents wanted to get an alternative to the Baltic Indices, while 54% wanted to keep them. However, some of the respondents wanting to keep the market as it is, still want to update how the indices are created. Breaking down the respondents who answered that the Baltic Exchange should be the only provider, we see that closer to half of these wish that more market participants were able to contribute to the creation of indices. If we then aggregate the total respondents in regards to how many that wants to either explore other options or keep the Baltic Indices but change the way they are created, we find that 76% of the respondents want a change in some way. These statistics are shown in the graph below.

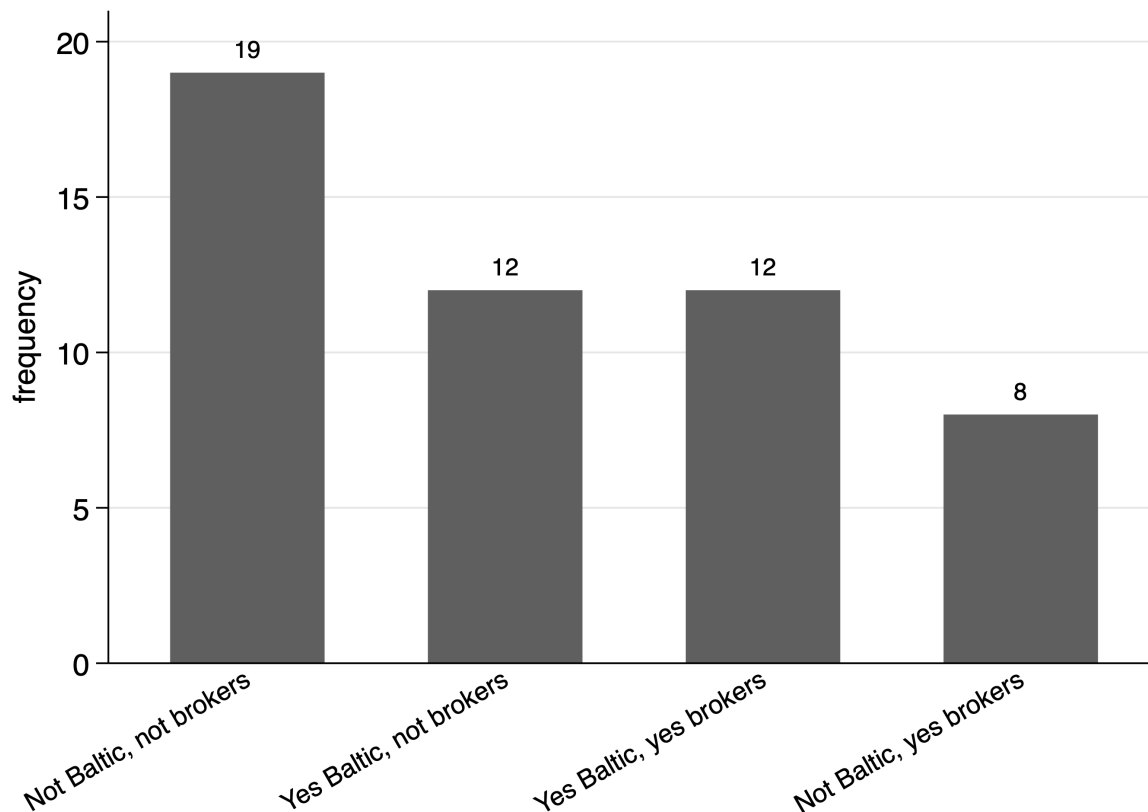


Figure 5, Baltic, brokers or both

The number of respondents shown in the graph is less than total responses due to the fact that not every respondent answered all the questions, making the combined statistics less achievable.

Respondents wanting alternative index-creators may have other motives than being the users of these. As discussed in the literature review and by Rauterberg and Verstein (2013) competition might be an instigator of change as well as a tool for making current solutions more compliant and resilient against manipulation. Multiple respondents noted that competition fosters innovation, pushes the Baltic to improve and that the market should be able to explore new options and decide the new equilibrium. Most markets gain from having competition, given that they are facilitated for it. The low liquidity characteristic of the shipping market is mostly given as the counterpoint by the respondents wanting to keep the Baltic as the only provider, especially focusing on the FFA markets' need for liquidity to function.

5. Concluding remarks

In this paper, we established a foundation for discussion regarding freight market indices and the production of these. Through interviews with key individuals in the shipping market as well as surveying a broader audience, we have gathered responses from different institutions and individuals making use of freight market indices, or more specifically dry bulk indices. The responses have then been used for analysis and interpretation to create the most unbiased view of what the market currently thinks about the Baltic Exchange, their indices, competing methodologies and competitors. We find that 76% wants to either change the way the Baltic Exchange creates their indices or explore alternatives. Behind these numbers, we find that some respondents want competitors to instigate innovation in a rather static shipping-industry, while others simply are not happy with the current solutions. In contrast, we find out that 24% wants to keep the Baltic Exchange as the only provider with brokers as the only contributor of freight market assessments– in other words maintaining the status quo.

We reviewed the difference between respondents wanting to keep the Baltic as the only provider to their counterparty and find that people *not* in favour tend to:

- Be more sceptical of the subjectivity of the brokers contributing
- Think that the indices are easier to manipulate than their counterpart
- Consider the indices to be staler as a result of daily updates instead of continuous
- Look at the information being used to create indices as more of a “black box decision” than their counterpart

In addition to this, we examined in-depth whether brokers should be the only contributor to the creation of indices or not. People wanting more, or different, contributors tend to:

- Be more sceptical towards brokers, as one should expect.
- View the subjective assessment as more problematic.
- Be more cautious about the risk of manipulation
- Be non-shipbrokers, making the metric slightly biased.

One of the arguments that tend to be returning for the respondents in favour of keeping only one provider of indices is the problematization of liquidity in a rather illiquid shipping-market. They stress that the division of transactions between platforms may contribute to destroying

the FFA-market as well as making the broker's assessment harder – since they do not get the view of the entire market. Most of the respondents wanting to have other providers tend to focus on either the Baltic Exchange not being neutral, not being transparent or that competition may lead to innovation.

Our approach has gathered a decent response from a diversified spectrum of market participants, but we acknowledge that the survey results might be somewhat skewed. Respondents being passionate about the subject might be incentivized to have gathered like-minded people to contribute to the survey-results, therefore slightly skewing the results. However, our way of distributing the survey – through the professional network of a renowned professor at the Norwegian School of Economics reduced the risk of selection bias. In our analysis, we mainly focused on the Likert-scale responses to reduce the risk of cherry-picking the textual answers that would fit our statements in the respective sections.

As with most papers examining opinions, we could have gotten more respondents to further strengthen the certainty of our findings. The paper is also limited by the to express a snapshot of the markets' belief, instead of a continuous development of attitudes – it is therefore not able to track trends in the market in a sufficient manner. In addition to this, Platts recently launched its platform (October 2019) and the effects are not readily available to study at this point in time. Furthermore, the IMO2020 regulations have not been effectuated yet, and the aftermath of this is therefore not examinable. This is also relevant in regard to data-driven indices as this is a method of index production that is still in development, and utilizers of this methodology is not yet defined.

Future research on related topics should try to capture the market consensus regarding which actors that could compete with the Baltic Exchange. In addition to this, several companies are starting to prevail with new technology entering the market. As a consequence, future research should attempt to encapsulate the effects of this and the possible market disruption following technological advancements. Even though we theorize in this paper that the market is too opaque in regard to transactions that are available, future solutions might be more fit to deal with this and therefore they should be examined. From the interview with the competitor that chose to remain anonymous, it became clear that one of the main problematizations for data-driven indices is how to collect data on the transactions. Research on this would, therefore, be of great contribution to the market – especially in regard to incentivizing market participants to willingly giving up the information.

Concluding, we see that the shipping-market is leaning towards being ready for a change in the way freight market indices are created. Prevailing technology and competing methodologies have already been developed. As noted by several respondents in the survey – it is a free market - the best, most reliable and efficient platform will win.

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Appendix

Appendix 1

Table A1 - Spearman's Rho coefficient showing the correlation for whether or not they want to keep the Baltic Exchange as the only provider of indices. The asterisk showing that the variables are significant at a 95% confidence level.

	Baltic~y
Baltic_only	1.0000
Benefits_b~1	0.3646*
Benefits_b~2	0.4219*
Benefits_b~3	0.2470
Benefits_b~4	0.0100
Benefits_b~5	-0.0035
Benefits_b~6	0.3087*
Drawback~c_1	-0.1512
Drawback~c_2	-0.1754
Drawback~c_3	-0.3737*
Drawback~c_4	-0.0510
Drawback~c_5	-0.1393
Drawback~c_6	-0.2522
Drawbacks_~7	-0.3167*
Drawbacks_~8	-0.2300
Benefits_t~1	0.0232
Benefits_t~2	-0.0921
Benefits_t~3	-0.1291
Benefits_t~4	-0.0972
Drawback~o_1	-0.0747
Drawback~o_2	0.0660
Drawback~o_3	0.1993
Drawback~o_4	0.0434

Table A2 – Spearmans Rho coefficient showing the correlation between wanting shipbrokers to be the only contributors to the creation of indices. The asterisk showing that the variables are significant at a 95% confidence level.

	Shipbr~3
Shipbroker~3	1.0000
Benefits_b~1	0.3932*
Benefits_b~2	0.3348*
Benefits_b~3	0.0730
Benefits_b~4	0.0501
Benefits_b~5	0.2340
Benefits_b~6	0.5249*
Drawback~c_1	-0.3236*
Drawback~c_2	-0.2533
Drawback~c_3	-0.2424
Drawback~c_4	-0.2266
Drawback~c_5	-0.4384*
Drawback~c_6	-0.6279*
Drawbacks_~7	-0.6299*
Drawbacks_~8	-0.3959*
Benefits_t~1	-0.4033*
Benefits_t~2	-0.3292*
Benefits_t~3	-0.2898*
Benefits_t~4	-0.3647*
Drawback~o_1	0.4247*
Drawback~o_2	0.0985
Drawback~o_3	0.2216
Drawback~o_4	0.0962

Appendix 2

Table A3 – Means and medians (p50) of Likert style questions categorized into whether or not they want to keep the Baltic Exchange as the only provider of indices.

-> Baltic_only = No																						
stats	Bene<c_1	Bene<c_2	Bene<c_3	Bene<c_4	Bene<c_5	Bene<c_6	Draw<c_1	Draw<c_2	Draw<c_3	Draw<c_4	Draw<c_5	Draw<c_6	Drawba>7	Drawba>8	Bene<n_1	Bene<n_2	Bene<n_3	Bene<n_4	Draw<o_1	Draw<o_2	Draw<o_3	Draw<o_4
N	32.00	32.00	32.00	32.00	31.00	32.00	32.00	32.00	31.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	32.00	31.00	32.00	32.00
mean	2.56	3.59	3.31	3.50	2.87	2.56	3.47	3.69	3.65	3.94	3.62	3.94	4.03	3.28	3.66	3.91	3.50	3.06	3.72	4.06	3.44	3.72
p50	2.00	4.00	4.00	4.00	3.00	2.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	3.50	4.00	4.00	4.00	3.00	4.00	4.00	4.00	4.00

-> Baltic_only = Yes																						
stats	Bene<c_1	Bene<c_2	Bene<c_3	Bene<c_4	Bene<c_5	Bene<c_6	Draw<c_1	Draw<c_2	Draw<c_3	Draw<c_4	Draw<c_5	Draw<c_6	Drawba>7	Drawba>8	Bene<n_1	Bene<n_2	Bene<n_3	Bene<n_4	Draw<o_1	Draw<o_2	Draw<o_3	Draw<o_4
N	27.00	27.00	26.00	27.00	27.00	27.00	26.00	27.00	27.00	27.00	27.00	27.00	27.00	27.00	27.00	27.00	27.00	27.00	27.00	27.00	27.00	27.00
mean	3.59	4.37	3.88	3.56	2.93	3.56	2.96	3.26	2.74	3.78	3.22	3.56	3.30	2.63	3.93	3.78	3.33	2.81	3.74	4.37	4.00	3.93
p50	4.00	5.00	4.00	4.00	3.00	4.00	3.00	4.00	3.00	4.00	3.00	4.00	4.00	2.00	4.00	4.00	4.00	3.00	4.00	4.00	4.00	4.00

Table A4 – Means and medians (p50) of Likert style questions categorized into whether or not they want shipbrokers to be the only contributors to the creation of indices.

-> Shipbrokers_belief3 = No																						
stats	Bene<c_1	Bene<c_2	Bene<c_3	Bene<c_4	Bene<c_5	Bene<c_6	Draw<c_1	Draw<c_2	Draw<c_3	Draw<c_4	Draw<c_5	Draw<c_6	Drawba>7	Drawba>8	Bene<n_1	Bene<n_2	Bene<n_3	Bene<n_4	Draw<o_1	Draw<o_2	Draw<o_3	Draw<o_4
N	28.00	28.00	28.00	28.00	27.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00	28.00
mean	2.68	3.71	3.43	3.57	2.74	2.29	3.54	3.68	3.39	4.07	3.71	4.21	4.32	3.29	4.14	4.21	3.82	3.36	3.57	4.07	3.57	3.75
p50	2.00	4.00	4.00	4.00	3.00	2.00	4.00	4.00	4.00	4.00	4.00	4.00	4.50	3.00	4.00	4.00	4.00	3.50	4.00	4.00	4.00	4.00

-> Shipbrokers_belief3 = Yes																						
stats	Bene<c_1	Bene<c_2	Bene<c_3	Bene<c_4	Bene<c_5	Bene<c_6	Draw<c_1	Draw<c_2	Draw<c_3	Draw<c_4	Draw<c_5	Draw<c_6	Drawba>7	Drawba>8	Bene<n_1	Bene<n_2	Bene<n_3	Bene<n_4	Draw<o_1	Draw<o_2	Draw<o_3	Draw<o_4
N	20.00	20.00	19.00	20.00	20.00	20.00	19.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
mean	3.70	4.20	3.68	3.50	3.35	4.05	2.63	3.05	2.95	3.65	2.70	2.85	2.80	2.30	3.20	3.45	3.20	2.40	4.35	4.45	4.15	4.05
p50	4.00	5.00	4.00	4.00	3.50	4.00	3.00	3.00	3.00	4.00	2.00	3.00	3.00	2.00	4.00	4.00	4.00	2.00	4.00	5.00	4.00	4.00

Appendix 3

Table A5 – Cronbach's Alpha values for Likert-Style questions about the Baltic Indices

Baltic indices	
Statement	Alpha
BB1	0,85
BB2	0,86
BB3	0,86
BB4	0,88
BB5	0,86
BB6	0,85
BD1	0,86
BD2	0,86
BD3	0,86
BD4	0,87
BD5	0,85
BD6	0,85
BD7	0,85
BD8	0,87
Total Alpha	0,87

Table A6 - Cronbach's Alpha values for Likert-Style questions about Transaction-based indices

Transaction-based	
Statement	Alpha
T-BB1	0,69
T-BB2	0,71
T-BB3	0,68
T-BB4	0,71
T-BD1	0,72
T-BD2	0,73
T-BD3	0,71
T-BD4	0,73
Total alpha	0,74

Appendix 4

Illustration 1 – Likert-style questions Baltic Indices benefits

Benefits of the Baltic Indices.

Please rate each option based on the following statement: "The Baltic Indices have an advantage because of the following benefit"

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
The panelist system of brokers gives a neutral assessment of the market	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Baltic Exchange is an institution with a long track record and established trust in the market	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Baltic Exchange makes measured changes to their indices only after an open discussion and consensus building with the industry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Baltic Exchange's indices takes into account rumors and trades not yet published when generating the indices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The broker generated indices still function even when there is extremely low liquidity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Baltic index system using panels of brokers (not principals) means the daily spot indices are very hard to manipulate	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other, please specify: <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other, please specify: <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Illustration 2 – Likert-style questions Baltic Indices drawbacks

Drawbacks of the Baltic Indices.

Please rate each option based on the following statement: "The Baltic Indices have a disadvantage because of the following drawback"

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
The standard routes do not mirror well where our vessels are trading	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The route weightings do not reflect the actual trading pattern of the global fleet in the segment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The daily index is stale and reflects yesterday's market situation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The market is more volatile than the index suggests because some brokers in the panel are not "on the ball"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Brokers' assessments reflects rumours, fixtures on subs that are not lifted etc. and therefore project a distorted market picture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
They are influenced by subjectivity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The broker assessments underlying the indices are formed in a "black box" with no transparency as to what information is used	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A daily index is insufficient in a fast-moving freight market. We should have real-time indices during Asian/London working hours.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other, please specify: <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other, please specify: <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Illustration 3 – Likert-style questions Transaction-based indices benefits

Benefits of transaction-based indices.

Please rate each option based on the following statement: "Transaction-based indices have an advantage because of the following benefit"

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
They are based on confirmed fixtures, therefore they are not influenced by rumours	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Full transparency in the methodology behind the index production	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The indices are based on objective data only	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Real time indices instead of updates at a specified interval	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other, please specify: <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other, please specify: <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Illustration 4 – Likert-style questions Transaction-based indices drawbacks

Drawbacks of transaction-based indices.

Please rate each option based on the following statement: "Transaction-based indices have a disadvantage because of the following drawback"

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
They are not able to take into account ongoing negotiations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Low liquidity will affect the volatility of the index	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
You risk the emergence of multiple index providers further decreasing the liquidity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Market participants with big books linked to the current indices might not be sufficiently incentivised to move to other platforms, hereunder, transaction-based indices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other, please specify: <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other, please specify: <input type="text"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>